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HARD RED SPRING QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

United States Department of Agriculture
Agricultural Research Service
North Central Region

1987 2401/

by

A. O. Crawford, A. Ottengaden, H. A. Berglund,
Technician, J. L. Olson, Secretary, Milling Lab
Research Services, Berglund and J. L. Olson,
Technician, Milling Lab, North Dakota State
University and V. L. Berglund, Research Food Technologist

Page 30.

Cooperation	2
Introduction	4
Source of the wheat	5
Table of contents	6
Methods	9
Discussion	12
Grain quality	14
Yield and quality	20
Experiments	23
Conclusions	30
References	

HARD RED SPRING QUALITY REPORT

On samples received from the 1986 crop

Source:

Spring and Durum Wheat Quality Laboratory
USDA, Agricultural Research Service
Harris Hall, N.D.S.U.
Fargo, North Dakota 58105

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REPORT OF PHYSICAL, CHEMICAL, MILLING AND BAKING
EXPERIMENTS WITH HARD RED SPRING WHEAT

1986 CROP1/

by

R. D. Crawford, A. A. Ottenbacher, M. A. Dregseth,
Technicians, J. E. Wohlman, Secretary, Agricultural
Research Service; 2/ M. Skunberg and L. L. Nolte,
Technicians, NDSU; 3/ Wallace H. Kunerth, Research
Chemist and V. L. Youngs, Research Food Technologist.2/

<u>Contents</u>	<u>Page No.</u>
Cooperating Agencies	2
Introduction	4
Source of the Samples	6
Table of Varieties and Crosses	8
Methods	9
Discussion	12
Uniform Regional Nursery Samples	18
Field Plot Nursery Samples	28
Explanation of Abbreviations, 1986 Crop .	29
Footnotes for Tables	30
Tables - No. 1 through No. 10	
Reference Mixograms	

1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. Cooperators submitting samples for analysis have been given analytical data on their samples prior to release of this report. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled by the Agricultural Research Service, U. S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

- 2/ Hard Red Spring & Durum Wheat Quality Lab., NDSU.
Youngs retired 10/3/86; Kunerth resigned 10/31/86;
Crawford will retire 3/11/88.
- 3/ Dept. of Cereal Science & Food Technology, NDSU.

1986 COOPERATING AGENCIES AND STATIONS

The cooperative agencies and stations conducting the varietal plot and nursery experiments from which the 1986 spring wheat samples were received are listed below:

Arizona Agricultural Experiment Station

Mesa

University of California, Davis

Imperial Valley

Minnesota Agricultural Experiment Station

Crookston, Morris, St. Paul, North area, South area

Montana Agricultural Experiment Station

Havre, Bozeman, Sidney

North Dakota Agricultural Experiment Station

Fargo, Minot, Williston, Dickinson, Langdon, Carrington

South Dakota Agricultural Experiment Station

Brookings, Redfield, Selby, Brentford

Idaho Agricultural Experiment Station

Aberdeen

Wyoming Agricultural Experiment Station

Sheridan

Washington Agricultural Experiment Station

Pullman

Wisconsin Agricultural Experiment Station

Madison

New York State College of Agric. & Life Sciences-Cornell Univ.

Ithaca

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by R. H. Busch, et al., Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1986.4/

4/ Busch, R. H. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1986. Agricultural Research Service, U. S. Department of Agriculture and State Agricultural Experiment Station, St. Paul, MN.

INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States⁴/ are milled each year by the USDA. The flours are assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators and other interested parties, quality data on the standard varieties and new strains of hard red spring wheat from the 1986 crop.

The same general format and techniques were used in evaluating the wheat as outlined in quality reports for previous years. The same computer scoring system has been used for the past several years, hence some faulting values differ slightly from previous years. In general, data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of other crop years are compared. The area averages are tabulated for the Uniform Regional Nursery varieties of Butte, Era, Chris and Waldron. A five-year average (5-YA) and the averages for the individual five years include all selections grown in the Uniform Regional Nurseries for that year. These results give an overview of individual years and the influence of environment on the crop. The actual crop characteristics may be somewhat different due to differences in varieties, but the change from year to year is applicable.

The evaluation of a sample involves three areas of analysis: kernel characteristics, milling performance and baking evaluation. A brief description of the methods is given on pages 9 to 11 of this report. It is possible to deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. No specific comments are made regarding the mixogram patterns, since reference mixograms for each of the general types are presented at the end of the report.

Some field work began the first week in April, but heavy snowfall the weekend of April 12 plus more rain delayed operations. Planting of the 1986 crop was completed the last two weeks of May.

The average flour extraction was 1.3% lower than the 1985 crop and also 0.5% lower than the 5-year average.

Wheat mineral content was higher than the 1985 crop and also higher than the 5-year average. The wheat protein content was 0.4% higher than the 1985 crop but was equal to the 5-year average. The physical characteristics of the wheat were somewhat lower than the 1985 crop and the 5-year average. Bake absorption was 2.3% higher than the 1985 crop and 1.6% higher than the 5-year average. Mix time was equal to the 1985 crop but 1/4 minute shorter than the 5-year average. The loaf volume for the 1986 crop was higher than both the 1985 crop and the 5-year average. Oxidation requirements were slightly lower.

SOURCE OF THE 1986 CROP SAMPLES

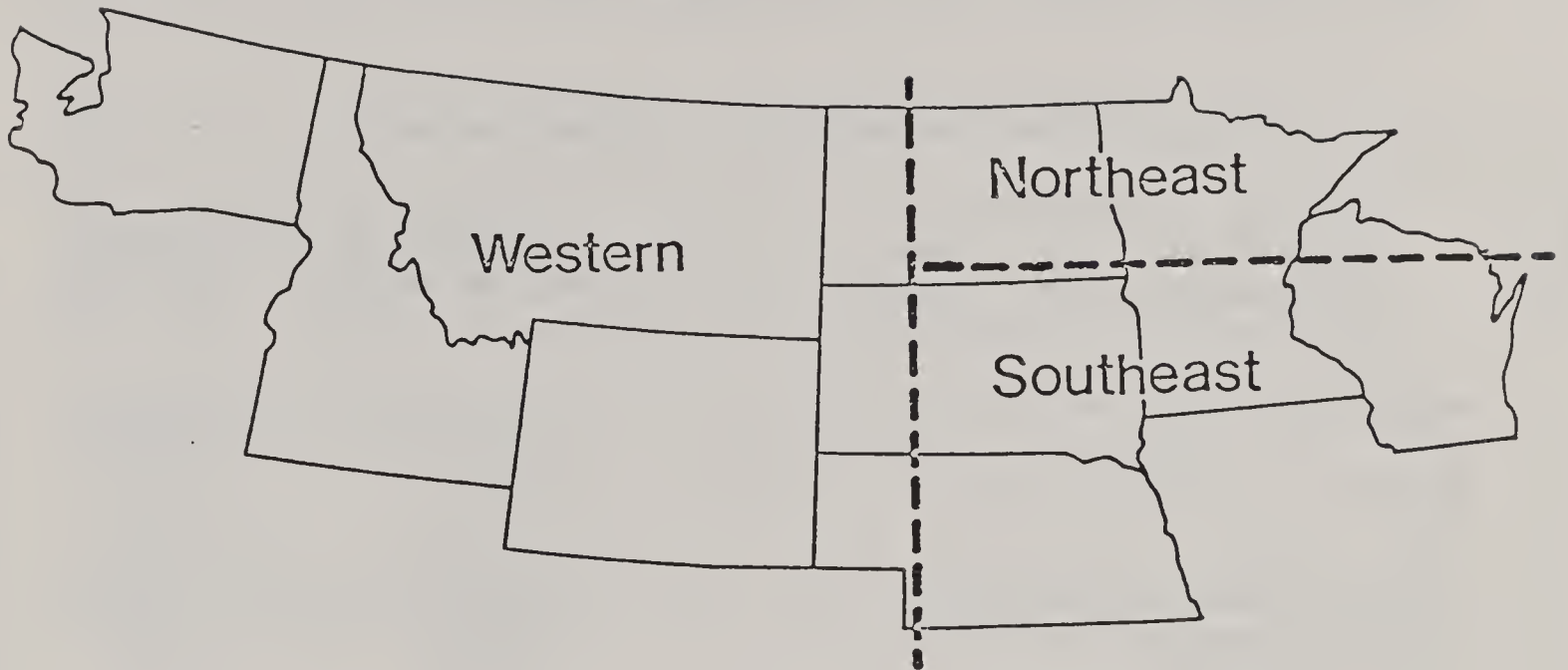
Tests were performed on 1,293 samples. However, data on 640 of these are not included in this report, because this information was of interest to plant breeders at specific experiment stations only. Data presented in this report are from the Field Plot Nursery and the Uniform Regional Nursery. The samples came from 21 stations in 10 states shown below:

Arizona: Mesa
California: Imperial Valley
Idaho: Aberdeen
Minnesota: Crookston, Morris and St. Paul
Montana: Havre, Bozeman and Sidney
North Dakota: Fargo, Minot, Williston, Dickinson
Langdon and Carrington
South Dakota: Brookings, Redfield and Selby
Washington: Pullman
Wisconsin: Madison
Wyoming: Sheridan

On page 8 are listed the spring wheats that were included in the Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number or the C.I. number are also given.

BLENDING AND AVERAGING PROCEDURES USED

Individual wheat samples from the Uniform Regional Nursery originating from the three geographical areas shown in the illustration on page 7 were blended according to area. All but one of the 21 stations were compatible for blending. (The results from that station are included as individual data.) Milling performance, mixograms and baking data were obtained from these area blends. However, data for kernel characteristics are arithmetical averages of individual sample analyses. These data from the Uniform Regional Nursery also are compared with averages from the previous four years (Table 1).



Wheat blends were made according to the geographical areas shown above.

Data for the Field Plot Nursery are on the individual samples.

THE UNIFORM REGIONAL HARD RED SPRING WHEAT PERFORMANCE NURSERY

The 30 entries in the 1986 URHRSWPN are listed below:

Entry No.	Cross or Variety	CI No. or Selection No.	Year Entered	Source
1.	Marquis	3561	1929	Canada
2.	Chris	13751	1969	USDA-MN
3.	Waldron	13958	1964	ND
4.	Era	13986**	1972	USDA-MN
5.	Butte	17681	1979	ND
6.	Butte/CO53427//WS1809	SD2956**	1984	SD
7.	SD2827/3/Burgas 2--/4/CNO	SD2962	1985	SD
8.	Butte*2/MN7125	SD2980	1986	SD
9.	Guard/SD2903//Butte	SD2990	1986	SD
10.	Butte/SD2700	SD2961	1986	SD
11.	MN7528/Butte	MN82047**	1985	USDA-MN
12.	MN72299/MN74115	MN81110**	1986	USDA-MN
13.	ND560/MN7595	MN82354**	1986	USDA-MN
14.	MN7311/MN7170	MN82008**	1986	USDA-MN
15.	MN81110/MN7533	MN84662**	1986	USDA-MN
16.	PM23/MT7448	MT8320**	1985	MT
17.	S1103/MT7448	MT8304**	1986	MT
18.	MT7336/Shortana	MT8402**	1986	MT
19.	SU-1*2/3/Lew//Tioga*2/RL6043	ND606	1985	ND
20.	Len//PI166308/Len	ND617**	1986	ND
21.	ND527/Coteau Sib//Era	ND618**	1986	ND
22.	Len//Butte*2/ND507/3/ND 593	ND626**	1986	ND
23.	Waldron*2/S6579//SU28-1*3/Agent	ND622	1986	ND
24.	Webster/Era//MN7125	HS82-175**	1985	NAPB
25.	Marshall/Len	HS82-288**	1985	NAPB
26.	MN7357/Marshall	HS84-700**	1986	NAPB
27.	MN7357/Len	HS84-873**	1986	NAPB
28.	Sel. from Male Sterile Fac. Rec.	C982-324	1986	WPB
29.	K73579/Borah	WA7075**	1985	WA
30.	NHS07664/[(Sq) Selkirk, NDM00004], 83-007	WA7329**	1986	WA
31.	[(Sq) Selkirk, NDM00004] NHS07664, 82-07	WA7330**	1986	WA

** Semidwarf

METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting with a Seedburo seed counter the number of kernels in a 10 g sample of cleaned, picked wheat^{5/}.

Kernel Size - The percentages of the size of the kernels (large, medium and small) were determined on a wheat sizer as described by Shuey^{6/}.

The sieves of the sizer were clothed as follows:

Top Sieve - Tyler #7 with 2.92 mm opening
Middle Sieve - Tyler #9 with 2.24 mm opening
Bottom Sieve - Tyler #12 with 1.65 mm opening

Potential Milling Yield - The potential yield is not shown on the computer tables, but it can be determined by multiplying the percentages of the overs of each sieve #7, #9 and #12 by the value of 78%, 73% and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson kicker and dockage tester and through a modified Forster scourer (Model 6). The clean, dry samples were pretempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

^{5/} Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U. S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

^{6/} Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5:71-72,75 (1960).

The Special Uniform Nursery Spring Wheat samples were milled on a Brabender Quadrumat Jr. mill. The mill was equipped with a #18 wire on the drum sieve. The throughs of the #18 wire were rebolted on a Strand sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The throughs of the #60 wire classified as flour, and this was the material tested. The overs of the #18 wire were classified as bran, and the overs of the #60 Tyler sieve as crude shorts.

The Uniform Regional Nursery blends and the Field Plot Nursery samples were milled on a Buhler continuous experimental mill. This mill has been slightly modified to give results more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66 and #105 stainless steel wire for the first, second and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Hardness Test

This year wheat hardness scores are reported on the samples. The procedure used requires grinding the wheat samples with a Udy grinder and obtaining data from a Technicon 400 near infrared analyzer. Wavelengths used were 1680 nm and 2230 nm. This procedure was developed by Mr. Karl Norris, USDA, Beltsville through a co-operative research project in which this Laboratory also participated. This procedure is not official and may be replaced with another in the future. Hard red spring wheats generally have scores between 60 and 85.

Protein Content - Both the Kjeldahl procedure and the near infrared technique were used to determine protein content. Nitrogen values, as determined by the Kjeldahl procedure, were multiplied by 5.7 to calculate protein values.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565°C. The results were reported as percentage of the sample weight.

Mixogram - The mixogram was determined by using 30 g of flour and adding 20 cc of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms that were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves--the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The samples were mixed to development in National Manufacturing mixers: the micro mixer for the 25 g samples and the 100 g special mixer for the 100 g samples. Bromate (5 ppm) for oxidation and barley malt flour (0.04%) for enzymatic supplement were added to each sample. All doughs were moulded in a Roll-Er-Up moulder.

Absorption - The amount of water, expressed as percent of the flour, required to bring the dough to proper consistency.

Crumb Color - A value was determined by comparing the loaf of the tested sample against a baking standard. This standard was an equal blend of the variety Len grown at Casselton and Minot, ND, Redfield, SD and Crookston, MN.

Loaf Volume - The volume of the baked loaf as determined by seed displacement.

All values (protein, ash and absorption) were reported on a 14% moisture basis.

DISCUSSION

The following discussion presents some of the basic techniques and criteria used in the milling and baking quality evaluation of the samples. There are three major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; baking score, to evaluate the flour as to type and overall baking quality.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to suggest elimination from future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

Five characteristics (test weight, 1000 kernel weight, percent small kernels, wheat mineral and wheat protein) were independent variables used to calculate the dependent variable - wheat score. Four characteristics (percent extraction, mineral @ 65% extraction, flour protein and milling character) were used to calculate the dependent variable - mill score. Seven characteristics (mixogram pattern, bake absorption, mixing time, dough characteristics, crumb color, crumb grain and loaf volume) were used to calculate the dependent variable - bake score. These three dependent variables after calculation become independent variables used to calculate the dependent variable - general evaluation.

This is the fifth year our current computer program has been used, which was designed and implemented to handle the analysis and tabulation for the data from each station. This program uses the Statistical Analysis Systems (SAS Institute, Inc., SAS Circle, Box 8000, Cary, NC 27511).^{7/}

The samples are tested and data collected on 17 quality factors or variables. The program then grades each factor against predetermined faulting values and assigns major (MJ) or minor (MI) faults where applicable. The data is then broken down into 3 major areas of concern to relate more directly to agronomic, industrial and consumer requirements. Each sample is assigned a score of 4 in the areas of Wheat Characteristics, Milling Characteristics and Baking Characteristics. The program then adjusts the score (4 = Good promise, 3 = Some promise, 2 = Little promise, 1 = No promise) depending upon the number of major and/or minor faults assigned to that sample.

^{7/} Nolte, L.L., Youngs, V.L., Crawford, R.D., and Kunerth, W.H. 1985. Computer program evaluation of hard red spring wheat. Cereal Foods World 30:227-229.

A general score is also given to each sample. This score is again 1-4 and is obtained by calculating the mean of the other 3 scores.

The following tables list the variables used in each scoring area and their specific faulting and scoring values.

WHEAT SCORE

<u>Variables Included</u>	<u>Faulting Limits</u>		<u>Effect on Score</u>	
	<u>Minor</u>	<u>Major</u>	<u>Minor</u>	<u>Major</u>
Test Weight (#/bu)	57.9	56.9	-	-1
1000 Kernel Weight ^a (g)	Mean-2.1	Mean-5.1	-	-1
Small Kernels (%)	8	16	-	-1
Wheat Mineral (%)	1.71	1.81	-	-
Wheat Protein (%)	13.9	12.9	-1	-2

^a The mean, or average, is calculated using the data from the standards tested with that station.

MILL SCORE

<u>Variables Included</u>	<u>Faulting Limits</u>		<u>Effect on Score</u>	
	<u>Minor</u>	<u>Major</u>	<u>Minor</u>	<u>Major</u>
Flour Extraction ^a (%)	Mean-2.1	Mean-4.1	-1	-2
Flr. Mineral @ 65% Ex. ^b				
Large Samples	.47	.51	-	-1
Small Samples	.57	.61	-	-1
Flour Protein (%)	12.9	12.4	-1	-2
Milling Character ^c	3	2	-1	-2

^a The mean, or average, is calculated using the standards tested with that station.

^b The large samples are milled on a Buhler experimental mill, and the small samples are milled on a Quadrumat Jr. experimental mill. Different values are used to compensate for the difference in the efficiency of the two mills and their respective procedures.

^c 5 = Normal. 4 = Normal-soft. 3 = Soft-normal. 2 = Soft. 1 = Gritty. 0 = Very soft.

BAKE SCORE

<u>Variables Included</u>	<u>Faulting Limits</u>		<u>Effect on Score</u>	
	<u>Minor</u>	<u>Major</u>	<u>Minor</u>	<u>Major</u>
Mixogram Pattern ^a	2,7 or 8	1,or 9-11	-	-1
Bake Absorption (%)	61.9	60.4	-1	-2
Mix Time (min.)	5.75-8.00	0-1.75	-1	-2
	or 2.00-2.75	or over 8.00	-1	-2
Dough Characteristic ^b	6,5	4 or less	-	-2
Crumb Color ^c	6-4	3 or less	-	-1
Crumb Grain ^d	7-4	3 or less	-	-1
Loaf Volume ^e (cc)	Lg. Mean-55	Mean-105	-1	-2
	Sm. Mean-21	Mean-31	-1	-2

- ^a Refer to reference mixograms for numerical curve pattern.
(1 = very weak--11 = very strong)
- ^b 9 = Elastic. 8 = Slightly elastic. 7 = Slightly pliable.
6 = Pliable. 5 = Very pliable. 4 = Very elastic.
3 = Bucky. 2 = Very, very pliable. 1 = Extremely pliable.
0 = Dead.
- ^c The column headed Crumb Color on the data tables has two scores. The first score is the brightness, or sheen, of the grain as compared to the standard(s). (Standard = 100.) The second score is a single digit indicating the color of the interior of the loaf. 9 = Bright white. 8 = White. 7 = Normal. 6 = Slightly creamy. 5 = Bright creamy. 4 = Creamy. 3 = Very creamy. 2 = Gray. 1 = Very gray. 0 = Dull.
- ^d The column on the data tables headed Crumb Grain also has two scores. The first score is a numerical comparison against the standard(s). The second score indicates the structure of the grain. 12 = Normal. 11 = Slightly irregular. 10 = Slightly open. 9 = Slightly irregular and open. 8 = Slightly open and irregular. 7 = Irregular. 6 = Open. 5 = Irregular and slightly open. 4 = Open and slightly irregular. 3 = Irregular and open. 2 = Open and irregular. 1 = Harsh. 0 = Soggy.
- ^e The mean, or average, is calculated using the standards tested with that station. "Lg." refers to the faulting and scoring values for 100 g. loaves. "Sm." refers to the faulting and scoring values for 25 g. (pup) loaves.

All samples, as in previous years, are compared with a milling and baking standard that represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can affect the quality of the wheat sample, such that the evaluation at certain locations could have all samples--even the named varieties--classified as questionable to unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable with those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture should be taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample consistently has higher wheat mineral content, it increases the probability of having high flour ash. Lower protein than the standard varieties is not desirable, because in a low protein crop year the probability of it having such a low protein as to be undesirable is much greater. Therefore, the protein must also be considered as a characteristic when comparing varieties grown in the same locality.

Milling Performance is very important, especially the subcategory of milling characteristics. If low extraction or high flour ash is obtained, these become major factors which are quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65%, so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams, and an adjustment would either have to be made in the milling flow or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended; therefore, it is important to maintain varieties with milling characteristics as uniform as possible.

The amount of protein recovered in the flour for a sample is of importance. High protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher wheat protein would be necessary to yield a flour with protein content comparable to that of a wheat that gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long, flat curve is more desirable than a short, peaked curve; however, an extremely long curve may be undesirable, if the flour would require excessive mixing for proper development. Both the pattern and length of the curve are important, and both must be considered. Abnormal curves, such as sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume and machinability. A sample which has low absorption would be unsatisfactory. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered to be questionable until further testing demonstrates whether a definite deficiency exists.

Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like balloons, which burst when blown up and collapse and yield low loaf volume or yield an extremely large volume with large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tightly and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. However, a summation of total and major deficiencies, and an average General Evaluation score for the number of years the sample has been tested are included in the discussion of individual varieties and selections of the Uniform Regional Nursery.

UNIFORM REGIONAL NURSERY SAMPLES - 1986 CROP

Discussion of Area Blends

A total of 607 Uniform Regional Nursery samples were received. However, only 558 wheat samples from 18 stations in 7 states were blended for this crop year by area. The areas tend to represent movement of the wheat in the market (See map, page 7). Kernel characteristics were determined on individual samples to eliminate possible erroneous results. The area blends were then milled and baked by our macro method. Thirty-one samples were received from each of the 18 stations. Twenty-six selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were the commercially named varieties Butte, Chris, Era, Marquis and Waldron.

Data from the southeast area blend are given in Table 2. The five stations included in this blend were Brookings, Redfield and Selby, South Dakota and Morris and St. Paul, Minnesota. Madison, Wisconsin samples were not included in the area blend because of the wheat characteristics. These samples were processed individually, and the data are reported in Table 5.

Data from the northeast area blend are given in Table 3. The five stations included in this blend were Fargo, Minot, Langdon and Carrington, North Dakota and Crookston, Minnesota.

Data from the western area blend are given in Table 4. The eight stations included in this blend were Williston and Dickinson, North Dakota; Havre, Bozeman and Sidney Montana; Aberdeen, Idaho; Sheridan, Wyoming and Pullman, Washington. Aberdeen, Idaho submitted four extra samples. Pullman, Washington submitted two extra samples, and Williston, North Dakota submitted three extra samples. These samples were processed individually, and the data are reported in Table 6.

Discussion of Area and Crop Year Averages

In Table 1 are given the average area results for the combined data of the varieties Butte, Chris, Era and Waldron samples submitted from the 7 states and 18 stations. The area average represents all samples that were grown in that area for the year cited.

The milling and baking results were obtained from the area blend of the wheats in equal proportions from each of the stations for the respective variety or selection. The regular 100 g straight dough rich formula was used in baking. The General Evaluation column includes the overall performance of the blend of each sample. The general evaluation given for the sample area blend may not agree with that of the individual wheat samples within the blend, since averages do not express the range, and poor characteristics may be masked. In an endeavor to clarify this problem, we have included in the discussion of the varieties and selections, the average general evaluation, the number of total deficiencies and the number of major deficiencies -- (Average General Evaluation - #Total Deficiencies/#Major Deficiencies).

Also given in Table 1 are comparisons of the previous five crop years, which include all selections grown in the Uniform Regional Nursery for that year, as well as the 5 YA. The 1986 crop kernel characteristics (test weight and 1000 kernel weight) were lower than the 5 YA. Bake absorption was 1.6% higher than the 5 YA while the mixing time was slightly shorter than the 5 YA. The dough character was slightly stronger, and the crumb grain was equal to the 5 YA.

The General Score shows both crop years 1986 and 1985 to be equal. The bake absorption was 2.3% higher than the 1985 crop; also the loaf volume was higher. However, the rest of the dough characteristics were equal to the 1985 crop. Test weight, 1000 KWT and flour extraction were somewhat lower than the 1985 crop while the wheat and flour protein were slightly better than the 1985 crop.

Discussion of Individual Varieties or Selections

For simplicity and brevity, as in previous reports, each selection or variety will be discussed from the general viewpoint rather than the individual areas.

Average results of the varieties Butte, Chris and Waldron for each of the individual areas were used as standards for the other selections from that area; therefore, a variety or selection may be rated satisfactory in two different areas, but comparison of the data may show much poorer results for one area due to adverse environmental conditions. Thus the sample with poor results could be rated as having unsatisfactory quality when compared with the overall spring wheat area, even though it may be rated as showing good promise for one area.

By using the same format as used in previous years and employment of the computer, all named varieties receive a general evaluation. (The word descriptions of these numerical scores are as follows: 1-1.4, no promise; 1.5-2.4, little promise; 2.5-3.4, some promise; 3.5-4.0, good promise.) Only those varieties in the "Good Promise" category could be consistently considered as acceptable to the trade both in the domestic, as well as foreign markets. Data for the named varieties of Butte, Chris, Era, Marquis and Waldron will be an average of each variety for the last three years.

<u>Butte</u>	(3.3 - 19/8)	<u>8/</u> - Some Promise
<u>Chris</u>	(3.8 - 13/3)	- Good Promise
<u>Era</u>	(2.9 - 30/13)	- Some Promise
<u>Marquis</u>	(3.0 - 30/12)	- Some Promise
<u>Waldron</u>	(3.8 - 14/3)	- Good Promise

C982-324 (2.5 - 15/6) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, test weight, wheat protein.

Milling Performance - Flour extraction, flour protein.

Baking Evaluation - Mix time, crumb color, crumb grain, mixograph pattern, loaf volume.

General Evaluation - Some promise.

HS 82-175 (2.8 - 18/10) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Crumb color, crumb grain, loaf volume.

General Evaluation - Some promise.

8/ (Average General Evaluation - # Total Deficiencies/Major Deficiencies)

HS 82-288 (3.7 - 10/2) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein, test weight, small kernels.

Milling Performance - Flour protein.

Baking Evaluation - Crumb color, crumb grain, mix time.

General Evaluation - Good promise.

HS 84-700 (2.8 - 12/4) (1 yr.)

Faults:

Kernel Characteristics - Wheat protein, test weight.

Milling Performance - Flour protein.

Baking Evaluation - Mix time, crumb grain, loaf volume.

General Evaluation - Some promise.

HS 84-873 (3.0 - 13/2) (1 yr.)

Faults:

Kernel Characteristics - Test weight, wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Crumb color, crumb grain, loaf volume.

General Evaluation - Some promise.

MN 81110 (3.8 - 9/1) (1 yr.)

Faults:

Kernel Characteristics - Test weight.

Milling Performance - Ash at 65% extraction.

Baking Evaluation - Crumb color, crumb grain, mixograph pattern, mix time.

General Evaluation - Good promise.

MN 82008 (3.8 - 5/1) (1 yr.)

Faults:

Kernel Characteristics - Test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Good promise.

MN 82047 (3.0 - 17/8) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Some promise.

MN 82354 (3.0 - 10/3 (1 yr.)

Faults:

Kernel Characteristics - Test weight, wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Crumb color, crumb grain, loaf volume, mix time.

General Evaluation - Some promise.

MN 84662 (3.7 - 4/2) (1 yr.)

Faults:

Kernel Characteristics - Test weight.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Good promise.

MT 8304 (3.4 - 13/2) (1 yr.)

Faults:

Kernel Characteristics - Small kernels, 1000 KWT, test weight.

Milling Performance - Ash at 65% extraction, flour extraction.

Baking Evaluation - Mix time, mixograph pattern, crumb grain.

General Evaluation - Some promise.

MT 8320 (3.4 - 16/6) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein, test weight, small kernels, 1000 KWT.

Milling Performance - Flour protein, flour extraction.

Baking Evaluation - Crumb grain, dough character.

General Evaluation - Some promise.

MT 8402 (2.9 - 12/3) (1 yr.)

Faults:

Kernel Characteristics - Test weight, small kernels.

Milling Performance - Flour protein, flour extraction, milling character.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Some promise.

ND 606 (3.5 - 10/6) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Crumb grain, loaf volume, mix time.

General Evaluation - Good promise.

ND 617 (3.7 - 9/1) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Flour protein.

Baking Evaluation - Mixograph pattern, mix time, crumb color, crumb grain.

General Evaluation - Good promise.

ND 618 (3.7 - 5/1) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Good promise.

ND 622 (3.8 - 4/1) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, crumb grain.

General Evaluation - Good promise.

ND 626 (3.5 - 5/3) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Flour protein.

Baking Evaluation - Crumb grain, loaf volume.

General Evaluation - Good promise.

SD 2956 (3.0 - 35/7) (3 yrs.)

Faults:

Kernel Characteristics - Wheat protein, small kernels.

Milling Performance - Flour protein.

Baking Evaluation - Bake absorption, mix time, mixograph pattern, crumb color, crumb grain, loaf volume.

General Evaluation - Some promise.

SD 2961 (3.2 - 7/3) (1 yr.)

Faults:

Kernel Characteristics - Wheat protein.

Milling Performance - Flour protein.

Baking Evaluation - Mixograph pattern, mix time, crumb grain.

General Evaluation - Some promise.

SD 2962 (2.8 - 21/7) (2 yrs.)

Faults:

Kernel Characteristics - Wheat protein.

Milling Performance - Flour extraction, flour protein.

Baking Evaluation - Mix time, crumb grain, loaf volume.

General Evaluation - Some promise.

SD 2980 (3.7 - 5/1) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Mix time, crumb grain, loaf volume.

General Evaluation - Good promise.

SD 2990 (3.6 - 5/1) (1 yr.)

Faults:

Kernel Characteristics - Satisfactory.

Milling Performance - Flour protein.

Baking Evaluation - Mix time, crumb grain, loaf volume.

General Evaluation - Good promise.

WA 7075 (3.2 - 29/13) (3 yrs.)

Faults:

Kernel Characteristics - Test weight, wheat protein, small kernels.

Milling Performance - Flour protein.

Baking Evaluation - Crumb color, crumb grain, loaf volume.

General Evaluation - Some promise.

WA 7329 (3.1 - 9/3) (1 yr.)

Faults:

Kernel Characteristics - Test weight, wheat protein, small kernels.

Milling Performance - Flour protein.

Baking Evaluation - Crumb grain, loaf volume.

General Evaluation - Some promise.

WA 7330 (3.2 - 13/4) (1 yr.)

Faults:

Kernel Characteristics - Test weight, 1000 KWT, wheat protein, small kernels.

Milling Performance - Flour extraction, ash at 65% extraction.

Baking Evaluation - Crumb grain.

General Evaluation - Some promise.

1986 UNIFORM REGIONAL HARD RED SPRING WHEAT
NURSERY SAMPLES NOT INCLUDED
IN THE AREA BLENDS

ABERDEEN, IDAHO

Two varieties, Borah and Pondera, and two selections A7710905-1 and IDO-238 were received from this station. Our 1986 Standard was used as the standard. The data for these samples are given in Table 6.

PULLMAN, WASHINGTON

One variety Wampum and one selection WPB 906R were received from this station. Our 1986 Standard was used as the standard. The data for these samples are given in Table 6.

WILLISTON, NORTH DAKOTA

Two varieties, Len and Stoa, and one selection 2369 were received from this station. Our 1986 Standard was used as the standard. The data for these samples are given in Table 6.

MADISON, WISCONSIN

This station was not included in the area blends because of kernel characteristics. The varieties used as standards were Butte, Chris and Waldron. The data for this station are given in Table 5.

FIELD PLOT NURSERY SAMPLES - 1986 CROP

Forty-six samples were received from three states at four stations. The data for the individual samples are given in Tables 7-10.

IMPERIAL VALLEY - CALIFORNIA

Five varieties and 16 selections were received from this station using Yecora Rojo as the standard. The data for this station are given in Table 7. The average general score for this station is 2.2.

FARGO, MINOT - NORTH DAKOTA

Seven named varieties were received from the Fargo stations using Butte, Len and Waldron as the standards. Six named varieties were received from the Minot station using Len and Waldron as the standards. The data for these two stations are given in Tables 8-9. The average general score for Fargo is 3.5, and for Minot the average general score is 3.5.

MESA - ARIZONA

One variety and eleven selections were received from this station using Yecora Rojo as the standard. The data for these samples are given in Table 10. The average general score for this station is 2.8.

EXPLANATION OF ABBREVIATIONS LISTED UNDER THE
HEADINGS AND THOSE THAT MAY BE LISTED UNDER
MINOR AND MAJOR DEFICIENCIES ON COMPUTER PRINTOUT

TW = Test Weight
KW = 1,000 Kernel Weight
LG = Large Kernels
SM = Small Kernels

WM = Wheat Mineral
WP = Wheat Protein
EX = Flour Extraction
M65 = Mineral at 65% Flour Extraction

FP; FLR PRO = Flour Protein
MC; MLG CHAR = Milling Characteristics
MLG PER = Milling Performance
MIX ABS = Mixograph Absorption

MX; MIX PAT = Mixograph Pattern Score
BA; BAKE ABS = Actual Bake Absorption
MT; MIX TIME = Actual Dough Mixing Requirements

DC; DOUGH CHAR = Dough Handling Characteristics
CC; CRUMB COLOR = Example - 100 5
 100 = Score received for brightness of the
 crumb grain
 5 = Creamy-the color characteristic of
 that particular loaf (only the
 second score is faulted)

CG; CRUMB GRAIN = Example - 86 5
 86 = Score received for crumb grain
 5 = Open-or characteristic of that
 loaf's crumb grain (only the
 second score is faulted)

LV; LOAF VOL = Loaf Volume

FOOTNOTES FOR TABLES

These footnotes are applicable for specified column headings in all tables that follow

<u>Column Heading</u>	<u>Footnote</u>
TEST WT	Clean dry - Subtract 1 lb/bu for dockage-free TW.
WHT ASH, WHT PRO, ASH @ 65%, FLR PRO, BAKE ABS (100 g loaf)	14% Moisture basis.
MILL CHAR	5 = Normal. 4 = Normal-soft. 3 = Soft-normal. 2 = Soft. 1 = Gritty. 0 = Very soft.
MIX PAT	Refer to reference mixograms for numerical curve pattern. (1 = Very weak - - - 11 = Very strong.)
DOUGH CHAR	9 = Elastic. 8 = Slightly elastic. 7 = Slightly pliable. 6 = Pliable. 5 = Very pliable. 4 = Very elastic. 3 = Bucky. 2 = Very, very pliable. 1 = Extremely pliable. 0 = Dead.
CRUMB COLOR	First column: A realistic score of brightness compared with a 1984 ND standard scored as 100. Second column: 9 = Bright white. 8 = White. 7 = Normal. 6 = Slightly creamy. 5 = Bright creamy. 4 = Creamy. 3 = Very creamy. 2 = Gray. 1 = Very gray. 0 = Dull.
CRUMB GRAIN	First column: A relative overall crumb grain score as compared with a 1984 ND standard scored as 90. Second column: 12 = Normal. 11 = Slightly irregular. 10 = Slightly open. 9 = Slightly irregular and slightly open. 8 = Slightly open and slightly irregular. 7 = Irregular. 6 = Open. 5 = Irregular and slightly open. 4 = Open and slightly irregular. 3 = Irregular and open. 2 = Open and irregular. 1 = Harsh. 0 = Soggy.

QUALITY DATA OF UNIFORM REGIONAL BLENDS
AREA AND CROP-YEAR AVERAGES

TABLE 1

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	SIZING LG %	WHT ASH %	WHT PRO %	HARD- NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
***WESTERN AREA ***															
AREA AVERAGE		61.5	33.3	32	2	1.58	14.0	75	4	70.2	0.32	12.9	5	3	4
BUTTE	S	62.8	33.6	35	2	1.50	14.2	72	4	70.0	0.28	12.8	5	3	3
CHRIS	S	61.5	29.7	20	2	1.70	14.6	75	4	70.4	0.31	13.9	5	4	4
ERA		62.0	30.1	20	3	1.63	13.0	76	3	70.5	0.33	11.6	5	2	3
WALDRON	S	61.1	33.6	39	1	1.63	14.6	76	4	69.2	0.32	13.2	5	4	4
***NORTHEASTERN AREA ***															
AREA AVERAGE		57.9	29.4	25	5	1.88	14.4	64	4	69.8	0.38	13.5	5	4	5
BUTTE	S	60.6	29.3	24	4	2.04	14.5	67	4	70.6	0.41	13.8	5	4	4
CHRIS	S	60.3	28.2	22	3	1.98	15.3	73	4	70.4	0.36	14.3	5	4	4
ERA		51.9	27.2	21	5	1.95	13.8	68	2	72.1	0.36	12.7	5	3	5
WALDRON	S	57.8	30.0	28	3	1.81	15.0	63	4	70.3	0.38	13.9	5	4	5
***SOUTHEASTERN AREA ***															
AREA AVERAGE		57.5	26.8	13	8	1.86	14.7	64	4	67.9	0.41	13.8	4	4	5
BUTTE	S	60.1	26.4	12	5	1.66	14.3	67	4	69.7	0.35	13.6	5	4	4
CHRIS	S	58.1	24.0	5	9	1.92	15.8	69	4	67.5	0.38	14.8	4	4	4
ERA		58.2	26.0	11	8	1.81	13.9	67	3	68.6	0.41	13.1	5	4	4
WALDRON	S	57.3	27.7	18	5	1.87	15.2	65	4	65.1	0.41	14.4	4	3	5
***CROP-YEAR AVERAGES ***															
1982 AVERAGE		59.9	32.2	36	4	1.68	14.7	.	4	70.5	0.38	13.9	5	4	5
1983 AVERAGE		59.4	30.6	19	4	1.81	14.7	.	4	68.8	0.39	13.7	5	4	5
1984 AVERAGE		60.0	31.5	30	5	1.66	13.7	.	3	69.9	0.39	13.0	5	4	5
1985 AVERAGE		60.8	32.4	33	3	1.62	14.0	.	4	70.6	0.36	13.0	5	4	4
1986 AVERAGE		59.0	29.8	23	5	1.77	14.4	67	4	69.3	0.37	13.4	5	4	5
1982-86 AVERAGE	S	59.8	31.3	28	4	1.71	14.3	67	4	69.8	0.38	13.4	5	4	5

QUALITY DATA OF UNIFORM REGIONAL BLENDS AREA AND CROP-YEAR AVERAGES

TABLE 1 (Cont.)

[illegible]

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=SOUTHEASTERN AREA NURSERY=UNIFORM

TABLE 2

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	LG %	SIZING SM %	WHT ASH %	WHT PRO %	HARD- NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
BUTTE	S	60.1	26.4	12	5	1.66	14.3	67	4	69.7	0.35	13.6	5	4	66.6	4
CHRIS	S	58.1	24.0	5	9	1.92	15.8	69	4	67.5	0.38	14.8	4	4	67.6	4
ERA		58.2	26.0	11	8	1.81	13.9	67	3	68.6	0.41	13.1	5	4	65.3	4
MARQUIS		54.2	23.0	5	14	1.84	14.6	58	3	66.9	0.45	13.9	4	4	65.7	4
WALDRON	S	57.3	27.7	18	5	1.87	15.2	65	4	65.1	0.41	14.4	4	3	66.6	5
C982-324		55.6	24.0	7	9	2.08	14.2	64	3	62.3	0.44	13.2	4	2	64.2	5
HS82-175		59.2	30.7	20	5	1.72	12.9	58	2	68.8	0.41	12.4	4	2	64.2	4
HS82-268		57.3	25.2	11	8	1.96	15.0	54	4	68.1	0.43	14.2	4	4	66.6	5
HS84-700		56.9	26.7	11	5	1.81	13.6	55	2	70.3	0.39	12.7	5	3	64.4	5
HS84-873		57.1	26.7	13	7	1.88	13.7	59	3	70.7	0.38	12.6	5	3	64.4	5
MN 81110		56.6	28.9	18	5	2.00	15.5	63	3	68.3	0.47	14.6	4	4	68.5	6
MN 82008		56.7	27.1	10	5	1.81	15.2	69	3	68.5	0.43	14.5	4	4	68.2	6
MN 82047		58.6	28.3	22	6	1.95	13.6	71	3	70.0	0.45	12.4	5	2	65.0	4
MN 82354		57.7	27.7	19	6	1.85	14.8	57	4	69.8	0.39	13.4	5	4	66.3	4
MN 84662		56.9	27.3	15	6	1.85	15.0	73	3	67.0	0.40	13.7	4	4	67.0	4
MT 8304		54.1	24.2	4	12	1.97	14.6	69	3	67.1	0.49	13.7	4	4	66.6	7
MT 8320		55.8	24.6	3	14	1.87	14.9	62	3	66.3	0.40	13.9	4	4	64.2	6
MT 8402		57.0	24.2	6	14	1.88	14.8	53	4	63.7	0.43	14.1	4	3	65.3	6
ND 606		59.5	27.7	16	5	1.76	14.9	88	4	68.8	0.39	14.0	4	4	67.6	5
ND 617		59.5	25.7	12	6	1.80	15.1	69	4	67.0	0.42	14.3	5	4	66.6	7
ND 618		58.6	26.2	8	7	1.87	15.6	77	4	69.0	0.40	14.8	4	4	68.5	5
ND 622		59.6	26.1	14	5	2.00	15.1	69	4	68.6	0.39	14.0	4	4	67.6	5
ND 626		60.0	30.4	32	4	1.79	15.4	72	4	68.8	0.40	14.5	4	4	67.6	6
SD 2956		60.1	28.3	11	5	1.75	13.7	56	3	70.9	0.35	12.8	5	3	62.5	3
SD 2961		59.5	30.0	20	5	1.65	14.1	59	4	69.7	0.36	13.2	5	4	61.6	8
SD 2962		59.4	30.2	15	6	1.79	14.9	59	4	66.2	0.42	14.0	4	4	62.5	4
SD 2980		61.6	30.9	26	2	1.72	14.6	65	4	70.0	0.34	14.0	5	4	65.3	4
SD 2990		60.3	26.4	7	6	1.74	14.5	73	4	67.8	0.38	13.3	4	4	65.3	4
WA 7075		54.7	26.3	10	9	1.87	14.2	57	3	68.0	0.46	13.5	4	4	63.5	5
WA 7329		53.5	27.0	15	9	1.97	14.8	54	3	65.7	0.46	14.0	4	4	62.8	3
WA 7330		50.2	21.4	3	20	2.07	15.9	51	2	64.4	0.50	15.0	4	3	67.9	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=SOUTHEASTERN AREA NURSEKY=UNIFORM

TABLE 2 (Cont.)

VARIETY	STD	BAKE		MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE		GENERAL SCORE ***	-----DEFICIENCIES-----													
		ABS %							SCORE ***			TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	DC	CC	CG	LV
BUTTE	S	66.9	4.50	9	100	7	88	3	955	3	3.7														MJ
CHRIS	S	68.1	3.25	9	100	7	87	3	980	3	3.7			MI											MJ
ERA		65.9	4.75	9	100	8	88	4	920	3	3.3			MI	MI										MJ
MARQUIS		66.7	3.75	9	100	7	87	4	970	3	3.3			MJ	MI	MI									MJ
WALDRON	S	67.3	4.75	9	100	8	88	8	935	4	3.7			MI		MI									MI
C982-324		65.6	5.75	9	101	4	88	3	890	1	2.0			MJ	MI	MJ					MI				MI
HS82-175		65.2	4.50	8	100	7	89	8	880	3	2.3			MI	MJ										MI
HS82-288		67.5	4.50	9	100	4	88	4	955	3	3.7			MI											MI
HS84-700		65.4	7.00	9	99	7	89	6	895	2	2.3			MJ	MI						MI				MI
HS84-873		65.5	5.00	8	100	4	88	4	860	2	2.7			MI	MI										MI
MN 81110		69.7	5.25	9	100	7	89	8	955	4	3.7			MJ											MI
MN 82008		69.3	5.00	9	101	8	89	8	950	4	3.7			MJ											MI
MN 82047		66.4	5.50	8	100	8	88	4	905	3	2.7			MJ											MI
MN 82354		67.5	3.75	8	100	4	88	4	885	2	3.3			MI											MJ
MN 84662		68.2	3.25	9	100	7	88	4	955	3	3.3			MJ											MJ
MT 8304		68.2	6.00	9	100	8	89	7	955	3	3.3			MJ	MI						MI				MI
MT 8320		65.4	5.25	9	102	8	87	4	960	3	3.3			MI											MI
MT 8402		66.6	6.00	9	101	8	86	3	1035	2	3.0			MJ	MI										MJ
ND 606		69.0	3.75	9	100	7	87	4	955	3	3.7			MI											MJ
ND 617		67.9	5.75	9	100	4	86	7	945	3	3.7			MI							MI				MI
ND 618		70.0	5.75	9	99	7	89	8	985	3	3.7			MI											MI
ND 622		68.9	4.25	9	101	8	88	8	985	4	4.0			MI											MI
ND 626		68.9	5.25	9	100	7	88	4	965	3	3.7			MI											MI
SD 2956		63.8	4.25	8	100	8	88	8	875	3	3.0			MI											MI
SD 2961		62.9	7.50	9	101	8	87	4	925	2	3.3			MI							MI				MJ
SD 2962		63.9	3.50	9	100	7	89	6	915	4	4.0			MI											MI
SD 2980		66.4	3.00	8	101	8	89	8	880	3	3.7			MI											MI
SD 2990		66.5	4.25	9	100	8	89	6	980	4	4.0			MI											MI
WA 7075		64.9	4.75	9	99	8	88	7	975	4	3.7			MJ	MI										MI
WA 7329		64.0	3.50	9	100	8	89	6	955	4	3.7			MJ	MI										MI
WA 7330		69.1	4.25	9	100	7	89	6	1010	4	3.0			MJ	MI	MJ									MI

DEFICIENCIES TW KW SM WP EX A65 FP MC MX BA MIX TIME (MT) DC CC CG LV
MINOR FAULTING VALUES 57.9 23.9 8 13.9 65.3 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 902
MAJOR FAULTING VALUES 56.9 20.9 18 12.9 63.3 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 852

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=NORTHEASTERN AREA NURSERY=UNIFORM

TABLE 3

VARIETY	STD	TEST WT #/BU	1000 LG	SIZING LG	WHT ASH %	WHT PRO %	HARD-NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
BUTTE	S	60.6	29.3	24	4	2.04	14.5	67	70.6	0.41	13.8	5	4	66.6	4
CHRIS	S	60.3	28.2	22	3	1.98	15.3	73	70.4	0.36	14.3	5	4	66.3	4
ERA		51.9	27.2	21	5	1.95	13.8	68	72.1	0.36	12.7	5	3	66.0	5
MARQUIS		54.6	22.3	17	14	1.91	13.0	49	67.1	0.43	12.3	4	1	62.8	3
WALDRON	S	57.8	30.0	28	3	1.81	15.0	63	70.3	0.38	13.9	5	4	67.6	5
C982-324		58.3	28.2	23	5	1.89	14.0	66	68.1	0.38	12.7	4	2	64.7	7
HS82-175		60.3	33.0	37	3	1.77	12.7	61	71.6	0.40	11.8	5	2	65.3	5
HS82-288		58.7	28.5	31	5	1.99	15.2	61	70.7	0.35	14.1	5	4	66.6	4
HS84-700		50.7	28.4	17	4	1.91	13.6	54	72.0	0.41	13.1	5	4	65.3	6
HS84-873		57.6	28.5	18	5	1.75	13.3	54	72.6	0.38	12.5	5	3	66.3	6
MN 81110		57.6	33.2	39	2	1.86	14.9	62	70.2	0.41	14.2	5	4	70.0	7
MN 82008		57.5	28.6	22	4	1.83	15.1	67	69.7	0.39	14.2	4	4	67.0	5
MN 82047		59.6	30.0	29	4	1.80	13.4	69	72.7	0.40	12.7	5	3	64.7	4
MN 82354		54.8	32.4	40	3	1.79	14.6	61	72.4	0.37	13.9	5	4	65.7	3
MN 84662		57.5	30.5	26	4	2.00	15.2	75	69.9	0.41	14.4	5	4	67.0	4
MT 8304		54.4	26.7	7	10	2.00	14.8	64	68.2	0.41	13.9	4	3	67.0	6
MT 8320		55.9	25.3	6	11	1.98	15.0	55	66.6	0.39	14.6	4	3	64.7	6
MT 8402		58.3	27.2	15	9	1.86	14.5	53	65.7	0.43	13.9	3	1	63.8	6
ND 606		60.1	31.5	32	3	1.74	14.8	87	71.1	0.44	13.4	5	4	69.1	5
ND 617		60.6	28.6	22	3	1.85	14.9	68	69.3	0.39	14.0	5	4	67.6	7
ND 618		58.5	27.6	15	3	1.94	15.5	71	69.3	0.38	14.4	5	4	67.9	5
ND 622		61.3	29.7	30	3	1.85	15.0	71	71.5	0.33	14.0	5	4	67.0	6
ND 626		60.5	32.4	45	3	1.82	15.1	71	70.6	0.36	14.3	5	4	67.3	6
SD 2956		59.6	30.4	24	4	1.81	13.7	56	70.3	0.36	12.9	5	3	64.2	3
SD 2961		59.9	32.6	35	3	1.76	14.1	62	69.7	0.35	13.4	5	4	63.5	6
SD 2962		60.3	32.0	24	4	1.98	14.3	59	67.2	0.41	13.3	4	3	63.5	4
SD 2980		61.6	32.4	37	2	1.90	14.4	63	69.5	0.33	13.2	5	4	65.7	3
SD 2990		60.9	28.4	13	4	1.89	14.5	72	69.1	0.34	13.1	5	4	68.5	6
WA 7075		56.4	30.4	24	4	1.78	14.0	61	70.1	0.36	13.0	5	4	66.6	6
WA 7329		56.7	32.5	36	3	1.90	13.9	59	69.9	0.40	13.1	4	4	64.2	3
WA 7330		51.8	24.1	9	14	2.08	15.4	52	65.5	0.43	14.4	4	2	65.7	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=NORTHEASTERN AREA NURSERY=UNIFORM

TABLE 3 (Cont.)

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	-----DEFICIENCIES-----															
										TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV	
BUTTE	S	67.2	3.25	9	100 7	88 4	940	3	3.7																MJ
CHRIS	S	67.3	3.00	9	101 8	89 11	905	4	4.0																
ERA		67.1	4.25	9	100 7	89 12	995	4	3.0																
MARQUIS		63.9	3.50	8	100 7	89 11	880	4	2.0																
WALDRON	S	69.0	4.25	9	100 7	88 6	950	4	4.0																
C982-324		66.2	6.00	8	100 7	86 3	885	2	2.7																
HS82-175		66.8	4.25	9	103 5	89 6	905	4	2.7																
HS82-288		68.0	3.50	9	100 7	88 6	955	4	4.0																
HS84-700		66.5	5.25	9	100 7	87 4	955	3	3.0																
HS84-873		67.4	5.25	9	100 4	88 3	940	3	3.0																
MN 81110		71.0	6.00	9	99 4	89 8	960	3	3.7																
MN 82008		67.7	7.00	9	101 8	89 6	965	3	3.7																
MN 82047		65.8	4.25	8	99 7	87 4	930	3	3.0																
MN 82354		66.6	3.00	7	99 7	90 12	850	3	3.3																
MN 84662		68.2	3.25	9	100 7	89 9	915	4	4.0																
MT 8304		68.3	6.25	9	101 8	88 6	985	3	3.0																
MT 8320		65.9	5.50	9	101 8	89 6	1040	4	3.3																
MT 8402		64.2	6.25	9	101 8	87 4	1010	2	2.3																
ND 606		69.4	3.75	8	100 7	88 6	860	3	3.7																
ND 617		68.0	5.50	9	100 6	86 4	960	3	3.7																
ND 618		68.3	4.50	8	102 8	88 6	905	4	4.0																
ND 622		67.4	4.00	9	100 7	85 4	955	3	3.7																
ND 626		67.6	4.50	9	100 7	87 4	950	3	3.7																
SD 2956		64.7	2.50	8	100 7	86 4	925	2	2.7																
SD 2961		63.5	6.75	9	101 8	90 13	925	3	3.7																
SD 2962		64.0	3.25	7	101 7	88 7	865	3	3.3																
SD 2980		66.0	3.00	8	102 8	88 6	895	4	4.0																
SD 2990		69.1	3.75	9	103 9	85 3	930	3	3.7																
WA 7075		67.2	5.00	9	101 8	86 4	1010	3	3.3																
WA 7329		64.6	3.25	7	101 8	89 12	860	3	3.0																
WA 7330		66.6	4.50	9	102 8	88 8	1005	4	3.0																

DEFICIENCIES TW KW SM WP EX A65 FP MC MX BA MIX TIME (MT) DC CC CG LV
MINOR FAULTING VALUES 57.9 27.1 8 13.9 68.3 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 8 877
MAJOR FAULTING VALUES 56.9 24.1 18 12.9 66.3 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 827

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=WESTERN AREA NURSERY=UNIFORM

TABLE 4

VARIETY	STD	TEST WT #/BU	1000 K.WT	G.	SIZING LG	WHT ASH	WHT PRO	HARD- NESS	WHEAT SCORE	FLR EXT	ASH @ 65%EX	FLR PRO	MILL CHAR	MILL SCORE	MIX ABS	MIX PAT
				%	%	%	%	%	***	%	%	%		***	%	
BUTTE	S	62.8	33.6	35	2	1.50	14.2	72	4	70.0	0.28	12.8	5	3	66.6	3
CHRIS	S	61.5	29.7	20	2	1.70	14.6	75	4	70.4	0.31	13.9	5	4	66.0	4
ERA		62.0	30.1	20	3	1.63	13.0	76	3	70.5	0.33	11.6	5	2	63.8	3
MARQUIS		61.6	31.5	26	2	1.57	14.1	74	4	69.3	0.31	13.1	4	4	65.7	3
WALDRON	S	61.1	33.6	39	1	1.63	14.6	76	4	69.2	0.32	13.2	5	4	66.3	4
C982-324		61.5	33.0	34	3	1.70	13.7	79	3	68.9	0.31	12.4	4	2	65.3	5
HS82-175		63.2	36.7	43	2	1.49	13.0	76	3	71.2	0.31	11.7	5	2	66.3	5
HS82-288		61.2	31.3	30	2	1.62	14.3	74	4	70.5	0.30	13.0	5	4	65.7	4
HS84-700		60.0	32.9	29	3	1.62	13.2	68	3	71.5	0.32	12.1	5	2	65.0	5
HS84-873		61.0	34.7	39	2	1.52	13.5	71	3	73.0	0.34	12.5	5	3	65.3	4
MN 81110		60.1	35.3	40	2	1.62	14.8	71	4	71.7	0.36	14.2	5	4	66.0	5
MN 82008		60.6	31.9	25	2	1.68	14.1	75	4	70.2	0.36	13.8	5	4	63.5	4
MN 82047		62.1	33.2	31	3	1.55	13.1	78	3	72.6	0.30	11.8	5	2	63.2	4
MN 82354		61.5	34.4	37	2	1.52	13.4	69	3	72.6	0.27	12.1	5	2	62.5	3
MN 84662		62.0	35.6	41	2	1.64	14.7	84	4	69.7	0.33	13.6	5	4	66.0	3
MT 8304		61.0	32.2	24	3	1.46	14.1	79	4	69.4	0.33	13.2	4	4	66.0	7
MT 8320		60.5	32.3	17	5	1.70	14.1	76	4	70.6	0.31	12.9	5	3	64.2	5
MT 8402		61.4	32.0	20	3	1.49	14.2	67	4	66.7	0.36	12.9	4	2	64.4	6
ND 606		62.1	33.4	32	1	1.44	14.4	90	4	70.3	0.34	13.4	5	4	66.6	4
ND 617		63.4	33.1	37	2	1.66	14.3	85	4	69.4	0.31	12.7	5	3	66.3	5
ND 618		61.4	31.0	22	2	1.63	15.1	82	4	70.7	0.34	14.0	5	4	67.6	4
ND 622		62.4	31.8	31	2	1.55	15.0	81	4	70.5	0.29	14.1	5	4	66.3	5
ND 626		61.9	34.8	46	2	1.55	14.5	80	4	71.9	0.30	12.9	5	3	65.7	5
SD 2956		62.0	35.1	34	2	1.61	13.9	66	3	69.7	0.33	12.8	5	3	62.8	2
SD 2961		61.4	34.5	38	3	1.42	13.8	70	3	69.3	0.30	12.0	4	2	66.0	6
SD 2962		62.8	35.5	32	2	1.53	14.0	68	4	66.7	0.31	12.3	4	1	65.7	4
SD 2980		63.6	35.1	41	1	1.51	14.5	71	4	69.1	0.28	13.7	5	4	67.6	4
SD 2990		62.5	31.5	22	2	1.44	14.0	77	4	68.1	0.29	12.5	4	3	68.8	4
WA 7075		60.1	34.8	34	2	1.55	13.4	69	3	70.6	0.36	12.1	5	2	67.0	4
WA 7329		58.9	37.1	43	3	1.65	13.3	65	3	70.7	0.36	12.3	5	2	65.0	4
WA 7330		58.0	31.0	17	4	1.70	13.8	67	3	68.2	0.37	13.1	4	4	65.3	4

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=REGIONAL BLENDS STATION=WESTERN AREA NURSERY=UNIFORM

TABLE 4 (Cont.)

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES											
										TW	KW	SM	WP	EX	A65	FP	MC	DC	CC	CG	LV
BUTTE	S	66.9	2.75	8	101 7	88 5	880	3	3.3	MI								MI		MI	MI
CHRIS	S	66.2	2.75	9	101 8	89 12	970	3	3.7	MI								MI		MI	
ERA		64.1	3.75	9	102 8	90 11	910	4	3.0	MI								MJ			
MARQUIS		65.9	2.75	8	101 8	90 11	900	3	3.7											MI	MI
WALDRON	S	67.4	2.75	9	101 8	89 7	920	3	3.7											MI	MI
C982-324		66.4	4.25	8	100 7	88 3	910	3	2.7	MI											
HS82-175		67.3	3.00	8	101 8	88 3	895	3	2.7	MI											
HS82-288		66.6	2.75	8	100 7	90 11	935	3	3.7											MI	
HS84-700		65.9	3.75	9	101 7	89 6	950	4	3.0	MI											MI
HS84-873		65.9	3.25	9	101 7	89 11	950	4	3.3	MI											
MN 81110		66.9	3.00	8	101 4	89 12	875	4	4.0												MI
MN 82008		64.1	3.00	9	101 8	91 13	925	4	4.0												
MN 82047		63.7	2.75	8	102 8	89 6	880	3	2.7	MI										MI	MI
MN 82354		63.1	2.50	8	100 7	89 12	860	2	2.3	MI										MI	MI
MN 84662		66.7	2.00	8	101 7	89 11	900	3	3.7												
MT 8304		66.9	4.50	9	102 8	91 12	940	4	4.0												
MT 8320		65.4	3.75	9	103 9	90 11	955	4	3.7												
MT 8402		65.7	4.75	9	103 9	91 12	990	4	3.3	MI											
ND 606		67.8	2.50	9	101 7	89 4	925	2	3.3												MJ
ND 617		67.5	3.25	9	102 7	88 6	975	4	3.7												MI
ND 618		68.9	2.75	8	100 7	87 4	975	2	3.3												MI
ND 622		67.3	2.50	9	101 7	88 6	960	3	3.7												MI
ND 626		66.8	3.00	9	102 8	88 4	865	2	3.0												MI
SD 2956		63.7	2.00	8	101 7	89 6	885	3	3.0	MI											MI
SD 2961		67.1	4.75	9	103 7	87 3	1000	3	2.7	MI											MI
SD 2962		67.0	2.50	9	100 7	87 3	915	2	2.3												MJ
SD 2980		68.6	2.00	9	102 8	87 4	905	2	3.3												MJ
SD 2990		70.0	2.50	8	101 7	88 11	865	2	3.0												MI
WA 7075		68.3	3.00	9	100 6	86 3	980	3	2.7	MI											MI
WA 7329		66.3	3.00	8	100 8	88 11	865	3	2.7	MI											MI
WA 7330		66.4	3.25	9	101 7	88 6	1000	4	3.7	MI											MI

DEFICIENCIES

MINOR FAULTING VALUES 57.9 30.2 8 13.9 67.8 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 868
MAJOR FAULTING VALUES 56.9 27.2 18 12.9 65.8 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 818

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
UNBLENDED UNIFORM NURSERY SAMPLES
MADISON, WISCONSIN

TABLE 5

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	LG %	SIZING SM %	WHT ASH %	WHT PRO %	HARD- NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
BUTTE	S	55.8	29.5	9	9	1.83	15.2	56	3	46.9	0.47	13.2	2	2	64.2	4
CHRIS	S	53.4	22.6	3	16	2.02	16.3	54	2	43.9	0.56	14.8	2	1	64.4	3
ERA		52.7	21.7	4	15	1.96	14.5	55	3	47.4	0.58	12.5	2	1	59.3	6
MARQUIS		53.9	20.5	22	2	2.28	14.9	49	2	41.0	0.65	13.1	2	1	62.5	4
WALDRON	S	53.4	26.0	14	11	2.02	16.4	56	3	48.6	0.58	14.6	2	2	63.5	4
C982-324		53.1	22.6	4	15	2.02	14.9	58	3	47.4	0.62	13.1	2	1	62.8	7
HS82-175		56.0	28.2	17	10	1.93	13.7	48	2	49.7	0.55	11.7	2	1	61.9	6
HS82-288		53.8	23.7	9	13	1.97	15.5	41	3	47.0	0.52	14.0	2	2	66.6	5
HS84-700		52.8	24.7	12	12	2.17	14.6	41	3	49.9	0.56	12.6	2	1	63.8	5
HS84-873		52.8	24.1	12	15	2.04	14.9	47	3	46.4	0.56	12.9	2	1	61.9	5
MN 81110		52.9	24.9	18	9	2.21	17.1	53	3	44.7	0.58	15.8	2	2	67.3	7
MN 82008		49.9	21.9	9	15	2.10	16.8	48	3	38.4	0.55	15.2	2	1	65.3	5
MN 82047		54.5	22.4	10	14	2.03	14.7	57	3	49.9	0.52	12.7	2	1	60.3	4
MN 82354		53.1	26.3	14	9	1.98	15.8	42	3	47.2	0.43	14.9	2	2	66.0	4
MN 84662		52.5	26.1	13	14	2.04	16.7	59	3	43.2	0.48	14.8	2	1	63.5	2
MT 8304		50.4	21.8	3	17	2.11	15.7	60	2	43.4	0.55	13.8	2	1	59.3	7
MT 8320		50.5	20.6	3	26	2.15	16.2	50	1	45.6	0.50	14.8	2	2	62.8	5
MT 8402		51.8	21.5	3	30	1.86	15.4	43	2	42.6	0.53	13.7	2	1	63.2	5
ND 606		54.3	26.5	6	11	1.96	16.4	73	3	48.6	0.54	14.4	2	2	64.4	5
ND 617		55.1	24.4	6	11	2.00	15.8	63	3	44.6	0.52	14.3	2	2	64.2	8
ND 618		52.5	25.8	6	12	2.05	16.9	59	3	46.1	0.52	15.6	2	2	66.3	5
ND 622		55.2	26.5	13	15	1.98	16.0	56	3	46.5	0.46	14.8	2	2	64.4	5
ND 626		55.6	30.7	30	6	2.00	16.7	63	3	43.9	0.52	15.2	2	1	63.8	6
SD 2956		55.9	28.2	10	13	2.00	14.7	47	3	45.6	0.45	12.7	2	1	60.0	2
SD 2961		52.6	29.8	11	15	1.96	15.3	43	3	44.1	0.49	14.1	2	1	59.7	10
SD 2962		55.8	33.9	19	15	1.84	15.6	48	3	38.6	0.50	13.6	2	1	64.2	5
SD 2980		56.7	30.1	25	7	1.93	15.8	50	3	44.5	0.41	14.3	2	2	67.9	4
SD 2990		55.8	27.2	6	13	1.88	15.5	62	3	46.2	0.46	13.6	2	2	65.3	4
WA 7075		51.2	25.2	6	15	2.04	15.0	51	3	49.1	0.52	13.6	2	2	65.0	6
WA 7329		52.6	25.4	10	14	2.15	15.2	56	3	47.1	0.54	13.2	2	2	63.5	3
WA 7330		46.1	20.2	3	29	2.47	16.9	51	1	43.7	0.57	15.6	2	1	66.0	5
BUTTE 86		55.0	29.0	19	7	1.92	16.1	63	3	44.7	0.49	14.3	2	2	66.0	5
COTEAU		55.0	25.8	3	15	2.06	16.6	63	3	47.9	0.53	15.5	2	2	65.3	5
ELLAR		53.0	27.0	20	12	2.16	16.4	50	3	45.6	0.51	14.6	2	2	63.2	3
GUARD		55.3	31.1	14	15	2.12	15.3	54	3	41.0	0.49	13.3	2	1	64.2	7
MARSHALL		54.6	26.6	5	14	1.98	15.1	46	3	48.1	0.43	13.1	2	2	63.5	4
STUA		52.6	27.8	6	14	1.65	16.6	64	3	43.8	0.51	15.0	2	1	68.5	6
WHEATON		50.0	30.2	14	15	1.94	14.9	47	3	43.4	0.46	12.9	2	1	65.0	5
ND 604		55.8	31.1	26	11	1.86	16.6	52	3	47.7	0.51	15.6	2	2	68.5	6
SD 8026		52.7	30.2	14	18	2.10	15.6	43	2	42.1	0.46	14.2	2	1	65.0	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
UNBLENDED UNIFORM NURSERY SAMPLES
MADISON, WISCONSIN

TABLE 5 (Cont.)

VARIETY	STD	BAKE		MIX TIME	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL	BAKE SCORE	GENERAL SCORE	DEFICIENCIES																
		ABS %	MIN								WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)				DC	CC	CG	LV		
								CC	***	***	***	TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	5.75-8.00	2.00-2.75	6	6	8	158
																						UNDER 1.75	OVER 8.00	4	3	4	148
BUTTE	S	64.2	3.75	8	100 7	88 6	173	4	3.0		MJ	MI	MI														
CHRIS	S	64.4	3.25	9	100 8	88 4	188	3	2.0		MJ	MI	MJ	MI													
ERA		59.3	6.00	8	101 8	88 6	180	1	1.7		MJ	MI	MI														
MARQUIS		62.5	4.00	7	100 7	89 8	173	4	2.3		MJ	MJ															
WALDRON	S	63.5	4.00	8	99 4	89 8	175	4	3.0		MJ	MI	MI														
C982-324		62.8	6.75	8	100 7	87 4	180	2	2.0		MJ	MI	MI	MI													
HS82-175		61.9	5.75	3	100 6	91 12	159	1	1.3		MJ	MI	MI														
HS82-288		66.6	4.00	9	101 6	90 12	189	4	3.0		MJ	MI	MI														
HS84-700		63.8	5.25	7	101 6	90 6	168	4	2.7		MJ	MI	MI														
HS84-873		61.9	5.00	9	102 4	88 4	193	2	2.0		MJ	MI	MI														
MN 81110		67.3	6.50	9	100 4	88 4	198	2	2.3		MJ	MI	MI														
MN 82008		65.3	4.50	9	103 9	87 4	204	3	2.3		MJ	MI	MI														
MN 82047		60.3	5.50	9	99 4	88 3	178	1	1.7		MJ	MI	MI														
MN 82354		66.0	4.50	9	100 4	89 11	181	4	3.0		MJ	MI	MI														
MN 84662		63.5	2.50	9	101 7	87 4	194	2	2.0		MJ	MI	MI														
MT 8304		59.3	5.75	9	101 8	88 8	190	1	1.3		MJ	MI	MJ	MI													
MT 8320		62.8	6.00	9	104 9	88 4	211	2	1.7		MJ	MJ	MJ	MI													
MT 8402		63.2	5.25	9	100 8	89 6	213	4	2.3		MJ	MI	MJ	MI													
ND 606		64.4	4.75	9	100 7	88 8	190	4	3.0		MJ	MI	MI														
ND 617		64.2	8.25	4	99 4	88 4	184	1	2.0		MJ	MI	MI														
ND 618		66.3	4.00	9	100 7	87 4	199	3	2.7		MJ	MI	MI														
ND 622		64.4	4.00	9	101 8	86 4	209	3	2.7		MJ	MI	MI														
ND 626		63.8	5.75	9	101 8	85 4	209	2	2.0		MJ	MI	MI														
SD 2956		60.0	3.00	9	100 4	87 4	185	1	1.7		MJ	MI	MI	MI													
SD 2961		59.7	8.75	9	99 4	87 4	185	1	1.7		MJ	MI	MI	MI													
SD 2962		64.2	3.75	8	100 7	87 4	183	3	2.3		MJ	MI	MI	MI													
SD 2980		67.9	3.00	9	100 8	89 6	192	4	3.0		MJ	MI	MI	MI													
SD 2990		65.3	4.00	8	101 8	88 4	180	3	2.7		MJ	MI	MI	MI													
WA 7075		65.0	6.25	9	101 4	87 4	189	2	2.3		MJ	MI	MI	MI													
WA 7329		63.5	3.75	7	102 8	90 12	172	4	3.0		MJ	MI	MI	MI													
WA 7330		66.0	5.00	9	100 7	88 4	187	3	1.7		MJ	MJ	MJ	MI													
BUTTE 86		66.0	4.00	8	100 8	89 4	179	3	2.7		MJ	MI	MI	MI													
COTEAU		65.3	4.75	9	102 6	88 4	194	3	2.7		MJ	MI	MI	MI													
ELLAR		63.2	4.00	8	101 7	89 8	183	4	3.0		MJ	MI	MI	MI													
GUARD		64.2	6.00	9	101 8	87 3	190	2	2.0		MJ	MI	MI	MI													
MARSHALL		63.5	4.25	8	100 4	89 6	186	4	3.0		MJ	MI	MI	MI													
STOA		68.5	5.00	9	100 7	87 4	180	3	2.3		MJ	MI	MI	MI													
WHEATON		65.0	5.50	9	101 4	88 6	189	4	2.7		MJ	MI	MI	MI													
ND 604		68.5	5.50	9	100 4	88 4	189	3	2.7		MJ	MI	MI	MI													
SD 8026		65.0	4.75	8	101 7	88 4	182	3	2.0		MJ	MI	MI	MI													

DEFICIENCIES TW KW SM WP EX A65 FP MC MX BA MIX TIME (MT) DC CC CG LV
MINOR FAULTING VALUES 57.9 23.9 8 13.9 44.4 .57 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 158
MAJOR FAULTING VALUES 56.9 20.9 18 12.9 42.4 .61 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 148

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
UNBLENDED UNIFORM NURSERY SAMPLES

TABLE 6

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	LG	SIZING SM	WHT ASH	WHT PRO	HARD- NESS	WHEAT SCORE ***	FLR EXT	ASH @ 65%EX	FLR PRO	MILL CHAR	MILL SCORE ***	MIX ABS	MIX PAT
*** ABERDEEN, ODAHO ***																
1986 N.D. STD.	S	60.3	30.6	37	3	1.74	15.7	53	4	59.1	0.51	13.7	3	3	63.5	7
BORAH		60.6	36.2	39	2	1.68	13.1	64	3	53.2	0.45	12.9	2	1	65.7	3
PONDERA		62.1	32.6	10	3	1.62	13.0	73	3	51.4	0.50	12.8	2	1	66.6	3
A7710905-1		61.4	33.8	26	3	1.72	13.4	64	3	50.7	0.51	13.2	2	1	65.7	5
ID0-238		62.2	38.6	59	1	1.59	13.5	68	3	52.9	0.41	13.2	2	1	65.3	5
*** PULLMAN, WASHINGTON ***																
1986 N.D. STD.	S	60.3	30.6	37	3	1.74	15.7	53	4	59.1	0.51	13.7	3	3	63.5	7
WAMPUM		60.4	27.5	5	4	1.90	10.8	66	2	45.6	0.53	10.0	2	1	60.3	2
WPB 906R		61.8	33.4	30	2	1.85	11.7	70	2	52.9	0.51	11.1	2	1	61.9	3
*** WILLISTON, NORTH DAKOTA ***																
1986 N.D. STD.	S	60.3	30.6	37	3	1.74	15.7	53	4	59.1	0.51	13.7	3	3	63.5	7
LEN		63.0	37.9	68	2	1.67	14.4	73	4	51.9	0.47	13.9	2	1	66.3	6
STOA		59.4	34.2	43	2	1.62	14.5	77	4	50.7	0.42	14.1	2	1	65.0	4
2369		64.1	38.5	52	2	1.56	13.8	74	3	51.9	0.44	13.4	2	1	64.4	6

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
UNBLENDED UNIFORM NURSERY SAMPLES

TABLE 6 (Cont.)

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	COLOR	CRUMB	GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	TW	KW	SM	WP	EX	A65	FP	MC	MIX TIME (MT)	DC	CC	CG	LV	DEFICIENCIES
*** ABERDEEN, IDAHO ***																								
1986 N.D. STD.	S	63.5	8.50	8	100	4	87	4	180	1	2.7									MI	MI			
BORAH		65.7	2.50	5	101	3	88	1	169	1	1.7									MI	MJ	MI	MJ	MJ
PONDERA		66.6	2.50	8	101	8	91	13	185	3	2.3									MI	MJ	MI		
A7710905-1		65.7	5.50	8	103	9	90	8	184	4	2.7									MI	MJ			MI
ID0-238		65.3	3.50	9	103	9	90	12	187	4	2.7									MI	MJ			
*** PULLMAN, WASHINGTON ***																								
1986 N.D. STD.	S	63.5	8.50	8	100	4	87	4	180	1	2.7									MI	MI			
WAMPUM		60.3	3.75	7	103	5	87	1	173	1	1.3			MI						MJ	MJ	MI	MJ	MI
WPB 506R		61.9	3.75	9	102	8	89	6	185	3	2.0									MJ	MJ	MI		MI
*** WILLISTON, NORTH DAKOTA ***																								
1986 N.D. STD.	S	63.5	8.50	8	100	4	87	4	180	1	2.7									MI	MI			
LEN		66.3	5.00	8	102	4	89	6	186	4	3.0									MJ				MI
STOA		65.0	4.50	7	102	8	89	8	177	4	3.0									MJ				MI
2369		64.4	7.50	9	102	8	89	6	183	3	2.3									MI	MJ	MI		MI
DEFICIENCIES																								
MINOR FAULTING VALUES		57.9	28.5	8	13.9		57.0		.57	12.9	3	2,7,8		61.9		5.75-8.00	2.00-2.75	6	6	6	8	8	159	
MAJOR FAULTING VALUES		56.9	25.5	18	12.9		55.0		.61	12.4	2	1,9-11		60.4		UNDER 1.75 OVER 8.00		4	3	4	4	4	149	

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=CALIFORNIA STATION=IMPERIAL VALLEY NURSERY=FIELD PLOTS

TABLE 7

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	SIZING LG %	WHT ASH %	WHT PRO %	HARD- NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
PROBRAND 775		63.4	36.0	39	4	1.71	12.0	84	1	72.2	0.37	10.9	5	65.3	5
PROBRED		64.8	47.6	72	1	1.46	11.8	75	2	70.3	0.42	10.3	5	63.5	4
TOPAZ		64.0	53.5	83	1	1.48	12.2	45	2	68.8	0.34	11.2	2	62.8	3
WESTBRED911		65.1	47.6	75	1	1.36	11.8	78	2	68.9	0.38	10.1	5	64.2	4
YECORA ROJO	S	65.0	44.4	65	1	1.45	12.0	85	2	70.2	0.35	10.3	5	64.2	6
P983-63		63.6	42.0	63	2	1.55	12.7	85	2	67.0	0.41	11.3	3	65.3	5
P983-83		64.4	46.1	71	1	1.42	12.8	82	2	70.2	0.37	11.3	5	66.6	5
UC 20		65.2	38.6	63	2	1.46	11.7	75	1	71.6	0.34	10.1	5	63.8	2
UC 112		64.8	45.7	64	2	1.44	12.3	87	2	69.9	0.35	10.6	4	64.4	5
UC 628		65.1	39.1	44	4	1.48	11.4	77	1	71.5	0.36	10.4	5	66.6	4
UC 633		65.0	40.3	76	2	1.40	10.4	82	2	72.7	0.33	9.2	5	62.5	2
UC 635		65.4	36.4	46	2	1.53	12.3	75	1	71.3	0.33	10.7	5	64.2	2
UC 638		65.0	44.2	73	2	1.52	12.5	69	2	72.6	0.35	11.3	5	64.4	5
UC 683		64.5	41.3	66	3	1.48	12.7	100	2	66.2	0.44	10.7	3	66.0	3
UC 684		64.7	40.8	69	2	1.51	11.9	77	2	69.2	0.40	10.8	4	64.7	3
UC 702		66.3	42.4	68	2	1.42	13.8	85	3	70.2	0.31	12.6	5	66.6	6
UC 703		65.4	42.7	65	2	1.45	13.9	86	3	70.2	0.32	12.0	5	66.6	3
UC 704		64.1	38.9	56	3	1.50	12.0	82	1	68.7	0.48	10.9	3	64.7	3
UC 705		63.2	44.2	75	4	1.45	12.7	84	2	68.6	0.45	11.3	4	66.3	3
82S 419		64.1	40.0	64	3	1.62	12.7	85	2	69.7	0.42	11.5	4	67.0	4
82S 723		64.0	36.5	41	4	1.56	12.8	70	1	69.1	0.40	11.4	4	65.0	5

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=CALIFORNIA STATION=IMPERIAL VALLEY NURSERY=FIELD PLOTS

TABLE 7 (Cont.)

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)	DC	CC	CG	LV	DEFICIENCIES
PROBRAND 775		65.5	4.25	7	101 7	87	4	790	3	2.0	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ
PROBRED		63.8	4.00	8	101 8	88	7	800	4	2.7	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
TOPAZ		63.7	2.75	7	102 8	89	11	765	3	2.0	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
WESTBRED911		64.9	4.75	7	101 8	86	4	710	3	2.3	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ
YECORA ROJO	S	65.1	5.00	7	100 7	85	3	725	3	2.3	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ
P983-63		66.2	5.00	6	100 7	84	4	710	3	2.0	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
P983-83		67.7	4.00	5	98 0	80	1	630	1	1.7	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 20		64.9	2.25	5	100 7	82	1	650	1	1.3	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 112		65.7	4.50	7	101 7	83	7	725	4	2.7	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 628		67.8	3.25	7	102 4	86	7	755	4	2.3	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 633		63.6	2.00	5	101 4	85	3	680	2	2.0	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 635		64.8	2.25	7	100 8	89	12	775	3	2.0	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 638		65.1	4.50	8	100 7	90	8	865	4	2.7	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 683		67.1	1.75	7	102 4	87	3	725	1	1.3	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 684		65.8	2.50	6	101 4	78	3	695	2	2.0	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 702		67.6	5.50	8	100 7	88	7	875	4	3.3	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 703		67.3	2.25	7	100 7	87	7	770	3	2.7	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 704		65.9	3.00	7	98 4	85	1	720	3	1.7	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
UC 705		67.7	2.00	8	101 4	86	3	840	2	2.0	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
82S 419		68.4	3.50	7	101 8	87	3	735	3	2.3	MI	MJ	MI	MJ	MI	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI
82S 723		66.4	3.50	8	101 7	87	4	790	3	2.0	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MJ	MI

DEFICIENCIES

MINOR FAULTING VALUES 57.9 42.3 8 13.9 68.1 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 670
MAJOR FAULTING VALUES 56.9 39.3 18 12.9 66.1 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 620

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=NORTH DAKOTA STATION=FARGO NURSERY=FIELD PLOTS

TABLE 8

VARIETY	STD	TEST WT #/BU	1000 LG	SIZING LG	WHT SM	WHT ASH	WHT PRO	HARD-NESS	WHEAT SCORE ***	FLR EXT	ASH @ 65%EX	FLR PRO	MILL CHAR	MILL SCORE ***	MIX ABS	MIX PAT
ALEX		59.0	26.8	13	7	2.02	15.6	72	4	65.0	0.44	14.9	3	2	67.6	4
BUTTE	S	59.1	24.3	5	8	1.73	14.1	70	4	68.5	0.36	13.1	4	4	65.7	4
COTEAU		58.1	25.7	7	8	2.00	15.3	68	4	67.8	0.46	14.3	4	4	68.5	5
LEN	S	57.7	23.1	9	10	1.93	14.7	64	4	67.8	0.46	13.8	3	3	66.0	7
MARSHALL		58.8	24.2	9	10	2.01	13.6	64	3	68.4	0.42	12.8	4	3	63.5	3
STOA		58.6	25.4	7	9	1.82	14.9	75	4	67.3	0.41	14.1	4	4	67.6	6
WALDRON	S	57.3	26.5	15	5	1.97	15.0	68	4	66.4	0.43	14.1	3	3	66.6	4

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=NORTH DAKOTA STATION=FARGO NURSERY=FIELD PLOTS

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)	DC	CC	CG	LV
ALEX		67.9	3.50	9	100	7	85	3	1030	3	3.0								MI					
BUTTE	S	66.0	5.25	8	100	7	88	7	865	4	4.0								MI					
COTEAU		69.0	3.75	9	100	7	89	7	1015	4	4.0								MI					
LEN	S	66.4	7.25	8	99	4	87	7	895	3	3.3								MI					
MARSHALL		63.8	3.50	8	100	7	88	8	910	4	3.3								MI					
STOA		68.1	6.00	9	99	0	89	8	975	2	3.3								MI					
WALDRON	S	67.5	3.75	9	101	7	86	4	920	3	3.3								MI					

DEFICIENCIES

MINOR FAULTING VALUES	TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)	DC	CC	CG	LV
57.9	22.5	8	13.9	65.5	.47	12.9	3	2,7,8	61.9	5.75-8.00	2.00-2.75	6	6	8	888
56.9	19.5	18	12.9	63.5	.51	12.4	2	1,9-11	60.4	UNDER 1.75	OVER 8.00	4	3	4	788

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=NORTH DAKOTA STATION=MINOT NURSERY=FIELD PLOTS

TABLE 9

VARIETY	STD	TEST WT #/BU	1000 LG	SIZING	WHT ASH	WHT PRO	WHT NESS	HARD- WHEAT SCORE ***	FLR EXT	ASH @ 65%EX	FLR PRO	MILL CHAR	MILL SCORE ***	MIX ABS	MIX PAT
			%	%	%	%	%	%	%	%	%	%	%	%	%
ALEX		61.8	33.3	43	2	1.59	13.9	68	3	69.1	0.36	13.7	4	67.9	5
COTEAU		61.9	35.2	58	0	1.57	15.1	76	4	69.7	0.36	14.3	4	68.8	4
LEN	S	61.9	39.4	80	0	1.56	14.6	75	4	71.3	0.33	14.1	5	68.8	6
MARSHALL		62.5	35.0	68	1	1.63	12.7	69	2	72.7	0.30	12.2	5	64.7	2
STOA		61.7	35.2	53	1	1.53	14.0	77	4	71.3	0.32	13.4	5	67.9	5
WALDRON	S	59.0	31.6	30	3	1.70	14.0	65	4	70.3	0.33	13.6	5	67.6	4

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=NORTH DAKOTA STATION=MINOT NURSERY=FIELD PLOTS

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	CRUMB COLOR	CRUMB GRAIN	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	DEFICIENCIES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
										TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MT	DC	CC	CG	LV																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ALEX		68.5	4.25	8	100	8	88	10	915	4	3.7		MI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

DEFICIENCIES TW KW SM WP EX A65 FP MC MX BA MIX TIME (MT) DC CC CG LV
MINOR FAULTING VALUES 57.9 33.4 8 13.9 68.7 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 903
MAJOR FAULTING VALUES 56.9 30.4 18 12.9 66.7 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 853

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=ARIZONA STATION=MESA NURSERY=FIELD PLOTS

TABLE 10

VARIETY	STD	TEST WT #/BU	1000 K.WT G.	SIZING LG %	WHT ASH %	WHT PRO %	HARD- NESS	WHEAT SCORE ***	FLR EXT %	ASH @ 65%EX %	FLR PRO %	MILL CHAR	MILL SCORE ***	MIX ABS %	MIX PAT
YECORA ROJO	S	62.5	38.8	42	4	1.46	14.7	81	4	69.8	0.39	13.4	5	67.0	5
I-542		62.6	38.6	42	4	1.51	14.1	75	4	69.3	0.40	12.7	4	66.0	4
I-678		63.4	37.0	32	4	1.51	12.9	79	2	67.9	0.42	11.5	4	64.2	4
I-679		63.6	41.3	47	3	1.43	14.7	86	4	67.9	0.37	13.1	4	66.6	5
I-682		63.0	36.0	18	4	1.49	13.3	73	3	68.9	0.37	12.1	4	65.7	4
I-683		62.8	35.2	16	7	1.50	13.5	79	3	69.1	0.43	11.9	4	65.0	6
I-694		63.3	42.4	51	3	1.45	12.8	79	2	72.2	0.39	11.5	5	64.2	5
I-704		64.3	33.8	17	5	1.42	14.4	90	4	69.0	0.40	12.4	4	67.0	7
I-736		64.3	42.4	51	3	1.47	14.0	84	4	69.9	0.38	12.5	5	66.6	5
I-766		64.1	40.2	55	4	1.52	13.8	88	3	64.0	0.41	12.2	3	68.2	4
I-783		63.2	38.5	44	3	1.47	14.2	81	4	68.5	0.40	12.8	4	67.0	5
P983-69		64.3	42.0	50	2	1.38	14.6	83	4	69.1	0.38	13.0	4	67.6	6

QUALITY DATA OF SPRING WHEAT SAMPLES 1986 CROP
STATE=ARIZONA STATION=MESA NURSERY=FIELD PLOTS

VARIETY	STD	BAKE ABS %	MIX TIME MIN	DOUGH CHAR	COLOR	CRUMB GRAIN	CRUMB VOL	LOAF VOL CC	BAKE SCORE ***	GENERAL SCORE ***	TW	KW	SM	WP	EX	A65	FP	MC	MX	BA	MIX TIME (MT)	DC	CC	CG	LV
YECORA ROJO	S	67.4	4.00	9	102	8	85	3	945	3	3.7														
I-542		66.6	4.25	9	101	8	88	6	930	4	3.7														
I-678		64.6	2.75	7	102	8	87	7	870	2	2.0														
I-679		67.0	4.25	7	101	8	87	7	865	3	3.7														
I-682		66.3	3.00	8	100	8	87	7	865	3	2.7														
I-683		65.6	5.50	7	100	8	87	4	780	1	2.0														
I-694		65.1	5.25	8	100	7	85	4	825	1	1.7														
I-704		68.0	6.00	8	100	8	86	3	880	1	2.3														
I-736		67.6	3.25	8	100	8	87	4	900	3	3.3														
I-766		69.4	3.00	8	100	7	86	4	840	1	1.7														
I-783		68.0	3.50	8	100	8	85	3	915	3	3.3														
P983-69		67.6	4.75	9	102	8	86	4	980	3	3.7														

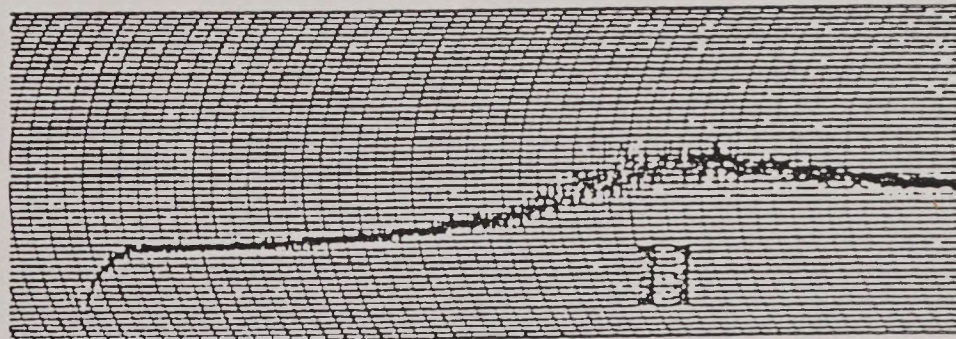
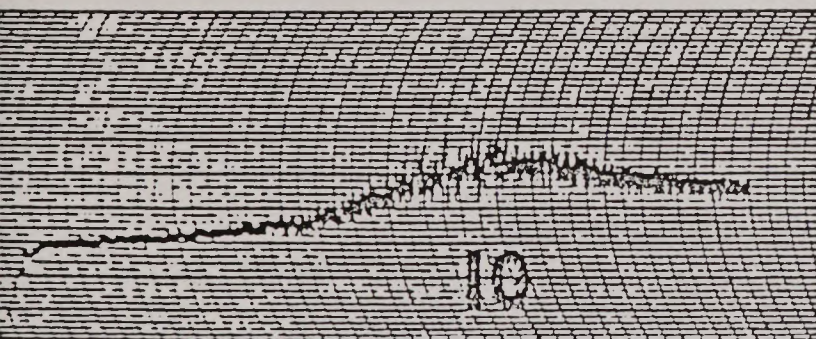
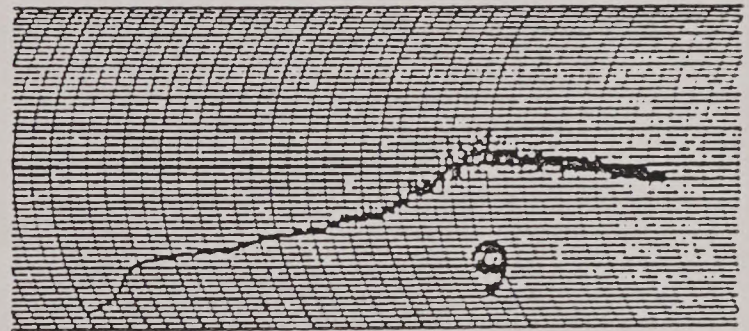
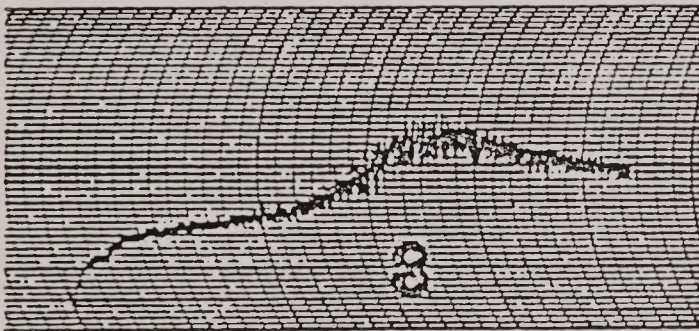
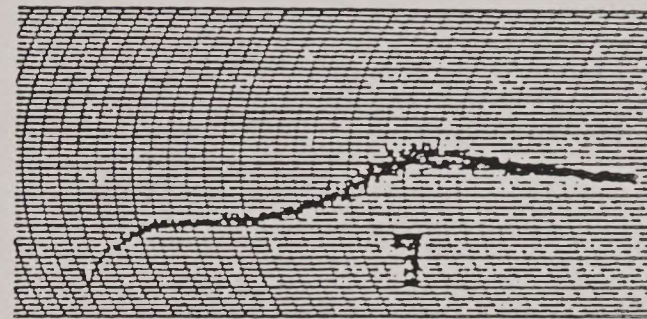
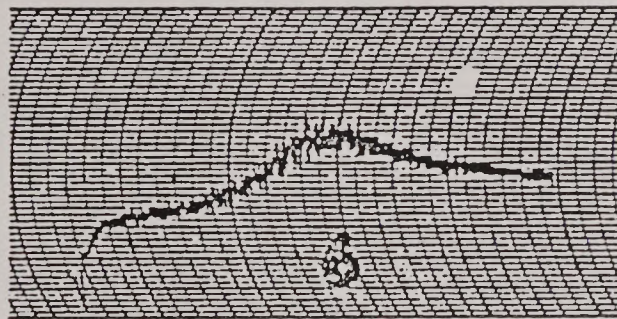
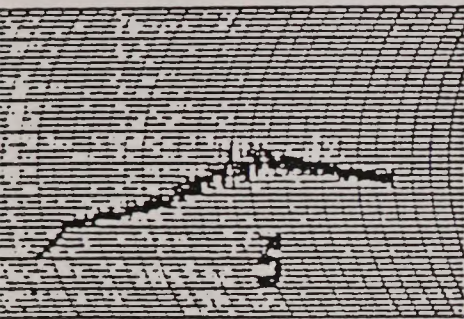
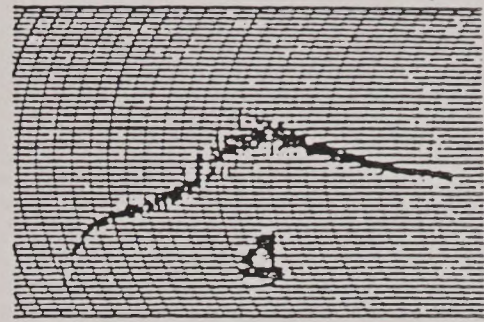
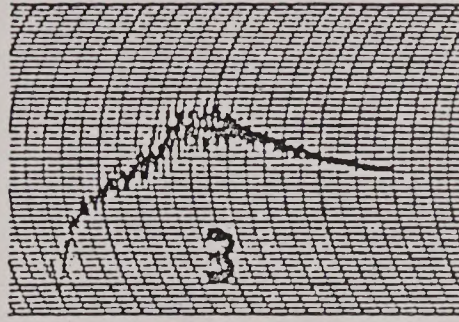
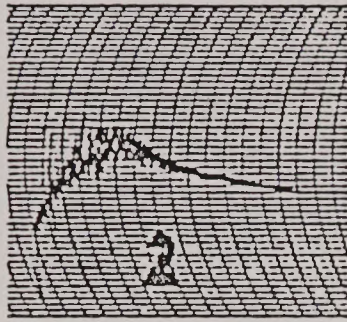
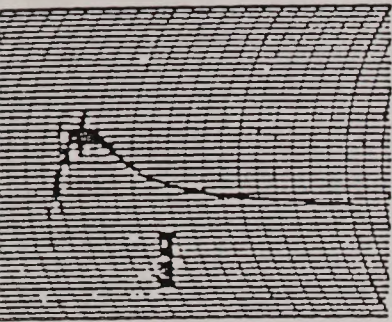
DEFICIENCIES

MINOR FAULTING VALUES 57.9 36.7 8 13.9 67.7 .47 12.9 3 2,7,8 61.9 5.75-8.00 2.00-2.75 6 6 8 890
MAJOR FAULTING VALUES 56.9 33.7 18 12.9 65.7 .51 12.4 2 1,9-11 60.4 UNDER 1.75 OVER 8.00 4 3 4 840

*** 1=NO PROMISE 2=LITTLE PROMISE 3=SOME PROMISE 4=GOOD PROMISE.

REFERENCE MIXOGRAMS

HARD RED SPRING WHEAT



U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA

